What is claimed is

1. A composition comprising from 30 to 99.5% by weight of a sulfonated aromatic polyether ketone which has an ion-exchange capacity of from 1.3 to 4.0 meq ($-SO_3H$)/g of polymer, and from 0.5 to 70% by weight of a polybenzimidazole.

2. A composition as claimed in claim 1, wherein the sulfonated polyether ketone has the repeat unit of formula I

$$-[Ar^1-O-Ar^2-CO]- \qquad (I),$$

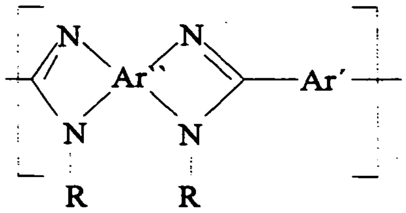
where Ar^1 and Ar^2, independently of one another, are bivalent, aromatic or heteroaromatic radicals, unsubstituted or substituted with one or more monovalent organic groups inert under usage conditions, and where at least a portion of the radicals Ar^1 and Ar^2 have substitution by radicals of the formula $-(SO_3)_wM$, where M is a metal cation of valency w, an ammonium cation or in particular hydrogen, and w is an integer, in particular 1 or 2.

3. A composition as claimed in claim 2, wherein Ar^1 and Ar^2 are naphthylene or in particular phenylene.

4. A composition as claimed in claim 2, wherein Ar^1 and Ar^2 have substitution by from one to four amino, alcohol, ether, alkyl, aryl, sulfonyl, phosphonyl, carbonyl, nitro or carboxylic acid groups, and/or the nitrogen atoms of the polybenzimidazole have substitution by these groups.

5. A composition as claimed in claim 1, wherein the sulfonated polyether ketone has an ion-exchange capacity of from 1.6 to 2.9 meq ($-SO_3H$)/g of polymer.

6. A composition as claimed in claim 1, wherein the polybenzimidazole has repeat structural units of the formula II



(II)

where Ar`` is a tetravalent aromatic radical, Ar´ is a bivalent aromatic radical and R is hydrogen or an inert monovalent organic radical.

7. A composition as claimed in claim 6, wherein Ar´´ is 1,2,4,5-phenylene or 3,4,3´,4´-biphenylene, Ar´ is 1,3- or 1,4-phenylene and R is hydrogen.

8. A composition as claimed in claim 2, wherein the proportion of the polybenzimidazole is selected depending on the degree of sulfonation of the sulfonated polyether ketone according to formula III below:

percent by weight
of polybenzimidazole = $9.4 \times -12.4 \pm (9.4 \times -12.4) \times 0.5$ (III),

where x is the ion-exchange capacity of the sulfonated polyether ketone in meq ($-SO_3H$)/g of polymer.

9. A composition as claimed in claim 1, wherein the type and amount of the polybenzimidazole and of the sulfonated polyether ketone are selected in such a way as to permit preparation of a solution in N-methylpyrrolidone with a viscosity of from 500 to 5000 mPas (measured at 80°C in a solution of the polymer in NMP using a Couette rotary viscometer).

10. A sulfonated aromatic polyether ketone of PEK type which has an ion-exchange capacity of from 1.3 to 4.0 meq ($-SO_3H$)/g of polymer.

11. A membrane comprising the polyether ketone as claimed in claim 10 or the composition as claimed in claim 1.

12. A membrane as claimed in claim 11, which has a thickness of at least 5 μm, in particular of at least 30 μm.

13. A membrane as claimed in claim 11, which has an ion-conductivity, mesured in contact with liquid water at room temperature with the aid of 4-pole impedance spectroscopy at a phase angle $|\Theta| < 1°$, of not less than 50 mS/cm.

14. A membrane as claimed in claim 11, which remains mechanically stable after treatment for 72 hours in boiling water at 100°C.

15. A membrane as claimed in claim 11, which has a modulus of elasticity (determined as gradient of the tangent at 1.2 MPa) in the dry state of at least 600 MPa at 23°C and 50% relative humidity.

16. A membrane as claimed in claim 11, which has a modulus of elasticity (determined as gradient of the tangent at 1.2 MPa) in water at 60°C of at least 90 MPa, and an ultimate elongation of more than 200%.

17. A membrane as claimed in claim 11, which has a residual solvent content of less than 0.5% by weight.

18. A membrane as claimed in claim 11, which has a proton-conductivity of more than 50 mS/cm in contact with water at room temperature.

19. A process for producing the membrane as claimed in claim 11, which comprises

a) preparing a solution comprising from 30 to 99.5% by weight of a salt of a sulfonated polyether ketone and from 0.5 to 70% by weight of a polybenzimidazole or of the PEK-type sulfonated polyether ketone by dissolving the polymer(s) in a suitable organic solvent, in particular dimethyl sulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide or N-methyl-2-pyrrolidone, and

b) shaping this solution by processes known per se, such as casting, doctoring, spraying or centrifugal processes, to give a membrane.

20. The process for producing a membrane as claimed in claim 19, wherein, after the membrane has been produced, it is freed from residual solvent and, as appropriate, from other water-soluble impurities present by washing in water or in a dilute acid of from 0.1 to 20% strength, for example nitric acid, sulfuric acid or phosphoric acid.

21. The process for producing a membrane as claimed in claim 19, wherein the membrane is dried by heating until the residual content of solvent is less than 0.5% by weight.

22. The process for producing a membrane as claimed in claim 19, wherein the solution comprising from 30 to 99.5% by weight of the salt of the sulfonated polyether ketone and from 0.5 to 70% by weight of the polybenzimidazole is introduced into an absorbent web and the solvent is then removed by evaporation.

23. The use of the membrane as claimed in claim 11 for application in fuel cells, in particular for application in direct methanol fuel cells..

24. The use of the membrane as claimed in claim 11 for application in high-performance capacitors.

25. The use of the membrane as claimed in claim 11 for application in electrodialysis or in ultrafiltration.